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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,309	02/27/2004	Masataka Mochizuki	249466US0DIV	4332
22850	7590	03/03/2005	EXAMINER VORTMAN, ANATOLY	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			ART UNIT 2835	

DATE MAILED: 03/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/787,309

Applicant(s)

MOCHIZUKI ET AL.

Examiner

Anatoly Vortman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7-9, 11, 12, 15 and 16 is/are pending in the application.
- 4a) Of the above claim(s) 7-9, 11, 12, 15 and 16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-6, 10, 14, 17 and 22-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Specie II in the reply filed on 01/13/05 is acknowledged. The traversal is on the grounds that "the Examiner has not carried the burden of providing any reason and/or examples to support any conclusion that the claims of the restricted groups are patentably distinct" (see p. 2, lines 8+ of the reply). This is not found persuasive because reasons and patentable differences have been clearly and explicitly recited in the body of the requirement. The Examiner would like to reiterate those differences (the different patentable features pertained to each specie are in bold and underlined):

Specie I, claims 4-9, 17, and 22-25, representative Fig. 3, an electronic device having **a graphite located between a die or an electronic part and a heat spreader.**

Specie II, claims 4-6, 10, 14, and 22-25, representative Fig. 4, an electronic device having **a condensable fluid.**

Specie III, claims 4-6, 11, 12, 15-17, and 22-25, representative Fig. 5 and 6, an electronic device having **a lubricating member buried in one face of a heat spreader.**

The aforementioned differences render the species patentably distinct and the search for all of the aforementioned species would constitute a serious burden on the Examiner.

Therefore, the restriction is proper pursuant to 35 U.S.C. 121, and it is not necessary to show a separate status in the art or separate classification (see MPEP 808.01(a)).

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Furthermore, the aforementioned patentable differences constitute mutually exclusive characteristics of the respective species and, therefore render the restriction proper (see MPEP 806.04(f)).

Furthermore, the Applicant's remarks that "if the invention is so narrowed, as to cover only one of the elected species, as noted above, Applicants cannot adequately claim the invention, without filing numerous patent applications. This is an undue burden on the Applicants" (see p. 3 of the previous reply filed on 11/15/04). This is not found to be persuasive, because if Applicant claims more than one independent and distinct invention in one application (like in the instant case), the examination of such application would create an undue burden on the Examiner.

In view of the above, the requirement is still deemed proper and is therefore made FINAL. Claims 7-9, 11, 12, 15, and 16 have been withdrawn from further consideration on the merits as drawn to non-elected species. The following is the Office action regarding the elected claims 4-6, 10, 14, 17, and 22-25 (Specie II).

Claim Objections

2. Claims 22 and 23 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claims, or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claims in independent form. Claims recite that a heat spreader is joined to a die or an electronic part. These limitations have been recited earlier in parent Claim 4.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 4-6, 17, and 22-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Parent claim 4 recites: "said heat spreader comprising a material having coefficient of thermal expansion approximate (emphasis added) to that of said electronic part". The term "approximate" renders the claims indefinite because it is a relative term which is not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the cooling art would not be reasonably apprised of the scope of the invention. The Examiner understands that term "approximately" must be read together with the more specific terms found in the specification. However, the instant specification provides only general statements and does not provide any specific values, ranges or proportions for the coefficients of thermal expansion so as to allow the person of ordinary skill in the cooling art to understand how close they meant to be.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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6. Claims 4-6, 22, and 23, as best understood, are rejected under 35 U.S.C. 102(b) as being clearly anticipated by US/4,914,551 to Anshel et al., (Anshel).

Regarding claim 4, Anshel disclosed (Fig. 1) an electronic device comprising: a heat spreader (37) joined to a die or an electronic part (17), said heat spreader (37) comprising a material having a coefficient of thermal expansion approximate to that of said electronic part (column 3, lines 51-58), wherein said electronic part (17) is cooled by transferring heat generated in said electronic part (17) to said heat spreader (37).

Regarding claims 5 and 6, Anshel disclosed, that said die or electronic part (17) is comprised of silicon (column 2, line 31), and wherein said heat spreader (37) comprised of aluminum nitride or invar (column 3, lines 48, 49).

7. Claims 10 and 14, are rejected under 35 U.S.C. 102(b) as being clearly anticipated by either US/5,582,242 to Hamburguen et al., (Hamburguen) or alternatively by US/5,412,535 to Chao et al., (Chao).

Hamburguen disclosed (Fig. 1) an electronic device comprising a die or an electronic part (20), a heat radiating structure (27) and a heat spreader (22), wherein said spreader (22) comprises a chamber formed in said heat spreader comprised of a sealed structure encapsulating a condensable fluid (32) therein which can repeatedly evaporate and condensate to transport heat.

Alternatively Chao disclosed (Fig. 1-3) an electronic device comprising a die or an electronic part (15), a heat radiating structure (11) and a heat spreader (20), wherein said spreader (20) comprises a chamber formed in said heat spreader comprised of a sealed structure

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encapsulating a condensable fluid therein which can repeatedly evaporate and condensate to transport heat (column 4, lines 37+).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 17, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anschel taken alone.

Regarding claim 17, Anschel disclosed all, but the specific ingredients of the invar (i.e. Mn, C, Ni, and Fe) and specific ratios of said ingredients (.4%, .2%, 36%, and 63.4%, respectively). The Official notice is taken of the fact that said ingredients have been notoriously known in relevant arts at the time the invention was made as ingredients commonly used for making the invar, thus it would have been obvious to select the aforementioned claimed ingredients of the invar for making the heat spreader of Anschel in order to achieve desired coefficient of thermal expansion of said heat spreader, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding the specific claimed ratios of said ingredients, these ratios are the result effective variables, wherein the result is a coefficient of thermal expansion of the heat spreader.

It would have been obvious to one having ordinary skill in the cooling art at the time the invention was made to select any appropriate ratios of said ingredients, including as claimed, in order to achieve the desirable coefficient of thermal expansion of the heat spreader, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 24 and 25, claims recite the way the electronic device is employed, i.e. that said electronic device is an MPU or an image processor. The Examiner would like to direct the Applicant's attention to the fact that the way said electronic device is employed does not affect the structure of the device. The cooling arrangement still would be the same, whether said device is an MPU, image processor, CPU, or any other heat producing component. What is important is only the fact that said component is producing the heat, which needs to be dissipated.

It would have been obvious to a person of ordinary skill in the electronic and cooling fields of endeavor to use the disclosed cooling arrangement of Anschel in conjunction with any electronic device in order to dissipate heat produced by said device and in order to satisfy the requirements of a particular specific application, since it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

Conclusion

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10. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure:

US/6317322, 6256201, 5720338, and 6490160 disclosed cooling arrangements for electronic components utilizing condensable liquids.

US//5296310 and 5151777 teach the use of invar for making cooling component with low coefficient of thermal expansion.

Please note, that the aforementioned US/6317322, 6256201, 5720338, and 6490160 could have been also used for rejection under 35 USC 102 of at least independent claims 10 and 14.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anatoly Vortman whose telephone number is 571-272-2047. The examiner can normally be reached on Monday-Friday, between 10:00 am and 6:30 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Lynn Feild can be reached on 571-272-2092. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Anatoly Vortman
Primary Examiner
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A handwritten signature in black ink, appearing to read 'A. Vortman', with a long horizontal line extending to the right towards the typed name.

AV